Self-assessment and students' study strategies in a community of clinical practice: A qualitative study

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Background: Self-assessment is recognized as a necessary skill for lifelong learning. It is widely reported to offer numerous advantages to the learner. The research evaluated the impact of students' and supervisors' self-assessment and feedback training on students' perceptions and practices of self-assessment. Moreover, it evaluated the effect of self-assessment process on students' study strategies within a community of clinical practice.

Methods: We conducted a qualitative phenomenological study from May 2008 to December 2009. We held 37 semi-structured individual interviews with three different cohorts of undergraduate medical students until we reached data saturation. The cohorts were exposed to different contexts while experiencing their clinical years' assessment program. In the interviews, students' perceptions and interpretations of 'self-assessment practice' and 'supervisor-provided feedback' within different contexts and the resulting study strategies were explored.

Results: The analysis of interview data with the three cohorts of students yielded three major themes: strategic practice of self-assessment, self-assessment and study strategies, and feedback and study strategies. It appears that self-assessment is not appropriate within a summative context, and its implementation requires cultural preparation. Despite education and orientation on the two major components of the self-assessment process, feedback was more effective in enhancing deeper study strategies.

Conclusion: This research suggests that the theoretical advantages linked to the self-assessment process are a result of its feedback component rather than the practice of self-assessment isolated from feedback. Further research exploring the effects of different contextual and personal factors on students' self-assessment is needed.

Keywords: *self-assessment*; *study strategy*; *feedback*; *summative assessment*; *clinical attachment*

Self-assessment has been recognized as a necessary skill for lifelong learning (1, 2). It is widely reported to offer numerous advantages to the learner. The dialogue between students and teachers and the skills acquired through self-assessment processes have been found to enhance student achievement, critical awareness and reflection on learning (1, 3). Self-assessment thus promotes a deeper approach to learning (4). However, research suggests that students' perceptions and the practice of self-assessment are unstable skills and can

be affected by variables such as students' gender, degree of ability, length of practice, breadth of the studied area and understanding of the criteria necessary to judge and effectively interpret their own work (5). This instability leads to inconsistent effects of self-assessment practice on students' self-regulation and even on their self-direction as lifelong learners (6), and inconsistencies in the strategies they use when their self-assessment practice leads to over- or underestimation of their performance. It also results in poor agreement between students'

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self-assessment ratings and their supervisors' in course performance, particularly in student ratings as measured by the supervisor (7).

Self-assessment is defined as 'the involvement of students in identifying standards and/or criteria to apply to their work and making judgments about the extent to which they have met these criteria and standards' (2). It is identified as a complex task: 'it is a pedagogical process by which a student undertakes the task of looking outward to seek feedback and explicit information from external sources and uses these externally generated sources of assessment data to direct performance improvement' (8). The process of self-assessment requires two main skills: skills in identifying self-ability in comparison to the required standards for a task, and skills in seeking and using constructive feedback (1, 9, 10). Students' enrichment with these specific self-assessment skills leads to enhancement of their empowerment and reduction of the unilateral assessment power of the academic staff (2, 11–15). It may increase students' interest, motivate them and shift the process from an assessment of learning to an assessment for learning (1, 16).

In the clinical context, students' knowledge of their training requirements, assessment and supervision creates a common ground for learning, guiding their study strategies and giving meaning to their actions and interactions. A community of students and supervisors in the clinical context creates the social fabric of student learning, fostering surroundings and interrelations that can be called a 'community of clinical practice' (17). In this community, self-assessment is interpreted as a learning experience that can stimulate learning by identifying standards and providing suggestions for improvement (18). Teachers in the community make an invaluable contribution to students' learning (19, 20) and face the difficult task of meeting two important objectives: meeting high performance standards for service and teaching and optimizing students' learning experiences by providing support, direction and constructive feedback (21).

Most of the published research within clinical practice has quantitatively evaluated students' self-assessment scores and compared them to the scores given by their teachers. To our knowledge, there has been no reflection on the effect of self-assessment on study strategies subsequently practiced by students. Furthermore, research on self-assessment within the medical education literature lacks a specific theoretical framework in its analysis. Within the community of clinical practice, summative assessment has resulted in the enhancement of students' motivation to learn at the cost of a superficial and achievement-motivated approach to learning (22, 23). However, formative assessment with feedback has resulted in a tendency toward a deep approach to learning (17, 22, 23). We are not aware of any research that has discussed the effect of self-assessment and the rule of

effective training in the process on students' study strategies in a clinical setting. Therefore, we aim in this paper to explore the relationship between students' perceptions and practices of self-assessment and their study strategies within a community of clinical practice. Moreover, in the conduct of this research we aimed to assess the impact of student and supervisor self-assessment and feedback training on students' perceptions and practices of self-assessment.

Methods

We conducted a qualitative, phenomenological study to explore the values, cultural influences, orientation/education influences and strategies used by students while practicing self-assessment in a community of clinical practice. To conduct this research, we structured our self-assessment practice and research to allow an in-depth exploration of different contexts that may affect student practice of self-assessment. We implemented an integrated self-assessment by the students and a summative assessment by the supervisors, in which the students self-assess and then compare their assessment with their supervisors' summative evaluations 'both students and supervisors assessments are performed on the same form parallel to the students' self-assessment'. Finally, the students receive constructive feedback and a plan for their future learning from their supervisors. We performed semi-structured individual interviews to give students the freedom to express their perceptions and practice of the two main components of self-assessment and the resulting study strategies. To provide a richer understanding of our research questions, we manipulated the contexts surrounding our research, in particular the interaction between summative assessment and self-assessment and student and supervisor orientation on self-assessment and feedback. We observed students practicing the process of self-assessment in different contexts and sampled three successive cohorts of students.

Study setting

The study was conducted at the King Saud bin Abdulaziz University for Health Sciences College of Medicine (KSAU-HS COM), Riyadh, from May 2008 to December 2009. The college accepts only male students and is housed within King Abdulaziz Medical City, a 1,000-bed tertiary care teaching hospital. KSAU-HS COM has a hybrid problem-based learning (PBL) curriculum. It is a four-year integrated graduate-entry program consisting of a two-year pre-clinical phase and a two-year clinical phase. The PBL extends into the clinical years along with direct patient encounters. The students practiced self-assessment during the clinical years of the curriculum only.

Assessment program

The assessment program for the clinical years at KSAU-HS COM is block-based. In each block, student assessment is composed of two main parts. The first is continuous assessment practiced throughout the block, which accounts for 40% of each block grade. This part includes students' clinical attachment evaluation, the mid-block multiple choice question (MCQ) exam, students' PBL session evaluations and finally their personal and professional development and community doctor session evaluations. The final examination accounts for the other 60% of the block grade, and consists of an objective structured clinical examination and MCQ exam.

Self-assessment practice

The curriculum at KSAU-HS COM during the clinical phase of student training (third and fourth years) is implemented in five major blocks. Internal medicine and surgical blocks are conducted during the first year of the clinical phase; obstetrics and gynecology, pediatrics and family and community medicine blocks are conducted during the second year. Each block is composed of several clinical attachments during which students rotate in different specialties and sub-specialties and are attached to different clinical supervisors. For example, in the obstetrics and gynecology block (nine weeks) students will experience five different clinical attachments: four weeks are spent in the general obstetrics and gynecology division, with three to four students attached to one clinical supervisor, after which students rotate in four other obstetrics and gynecology clinical attachments (one week each) – labor and delivery, perinatology, neonatology and reproductive endocrinology. The last week of each block is usually left for the clinical and written final exams. In all the attachments, supervisors are requested to implement curriculum objectives, guide their students, teach, assess and provide them with constructive feedback. At the end of each clinical attachment within each block, students arrange a meeting with their supervisor, during which students should provide their self-assessment for that attachment. This self-assessment includes performance in the domains of knowledge, clinical skills and communication as well as professional and ethical aspects. Following a discussion of the self-assessment, the supervisor gives the student a parallel summative assessment of performance in the clinical attachment and written and verbal feedback that aims to guide the student's future progress. The supervisor's clinical attachment assessment provides 5% of the total block grade.

Educational/orientation workshops (second and third cohorts of students)

We designed separate student and clinical supervisor half-day orientation workshops aiming to assess the effect of student and faculty orientation on self-assessment on students' perception of this type of assessment. Student workshops were implemented for the second and third cohorts of students only. The process was accompanied by a practical session on how to practice self-assessment and utilize supervisor feedback. The supervisor workshops were started after the completion of the first cohort of students' interviews and were accompanied by a practical session on how to provide constructive feedback. We repeated both workshops until we ensured that all clinical supervisors and students who were eligible to participate in the research had attended the training activity. Time for questions and discussion and a contact person for further advice were provided.

Separating the summative assessment process from the self-assessment process (third cohort of students only)

To assess the summative impact on the students' perception and practice of self-assessment, we separated the summative assessment process from the self-assessment process for a third cohort of students who had attended the orientation program on self-assessment and feedback.

We modified the previously implemented integrated summative/self-assessment process by separating the two processes while maintaining identical assessment forms for students and supervisors. Based on these changes, at the end of each clinical attachment students completed the self-assessment forms and submitted them independently to the block secretary. The supervisor completed the attachment summative assessment without having seen the student's self-assessment, and also submitted the form to the block secretary. Subsequently, student and supervisor met with both forms available to them; the student received supervisor feedback and an improvement plan. Thus while the first two cohorts of interviewed students performed their self-assessment parallel to their supervisors' summative assessments and on the same form, the third cohort's self-assessments and their supervisors' summative assessments were performed independently on two different forms.

Study population

We recruited students using a step-wise purposeful sampling approach (Table 1). To obtain richer data, we interviewed students from three different cohorts that

Table 1. Three different cohorts invited and interviewed during the research interventions

Cohort 1 (2007–2008)	Cohort 2 (2008–2009)	Cohort 3 (2009–2010)
Invited 37 students	Invited 32 students	Invited 22 students
Interviewed 13 students	Interviewed 10 students	Interviewed 14 students

were exposed to different experiences while practicing their self-assessments (Fig. 1). All three interviewed cohorts were students in the clinical phase of the curriculum. We interviewed the first two cohorts before the separation of self-assessment from the summative assessment. We interviewed the third cohort of students after the separation of these two processes in an attempt to assess the summative impact on students' self-assessment practices and the resulting study strategies.

Cohort 1 (G1): All 37 students in the 2007–2008 academic year were invited to participate in the study. We staged interviews at the students' convenience and based on their study schedules. Students participated in 13 semi-structured individual interviews, after which data analysis revealed data saturation.

Cohort 2 (G2): The same process was repeated with a second group of students after the implementation of an orientation program on self-assessment and feedback. All 32 students who had recently reached the clinical phase in academic year 2008–2009 were invited for interviews. We interviewed 10 students, after which analysis revealed data saturation.

Cohort 3 (G3): Finally, we invited all the 22 students who had recently reached the clinical phase of the curriculum in academic year 2009–2010 to participate in the study. We implemented student and supervisor orientation programs on student self-assessment and feedback, and administratively separated students' self-assessment process from their supervisors' summative assessment process. We interviewed 14 students, after which analysis revealed data saturation. No student withdrew consent to participate in the study and no student was interviewed in more than one cohort.

Data collection

The principal author and one co-author interviewed students using open-ended questions (Appendix 1), presented in a natural, non-threatening, conversational and informal setting. We asked the students to talk about their perceptions of their self-assessment, its practice and factors affecting this process and their study strategies. These factors included the effects of summative assessment and orientation on the self-assessment process on their self-assessment practice. The open-ended questions were based on the research team's observation of students' and supervisors' practices of self-assessment and feedback. Each individual interview lasted approximately 25–45 minutes. The interviews were audio-taped, and field notes were taken.

Data analysis

A research assistant performed verbatim transcription of the interviews. The transcripts were analyzed by the principal author and then managed utilizing Atlas.ti (Version 5.2) software. Analysis involved line-by-line scrutiny of the transcript and the assignment of relevant codes to text fragments. We identified codes and themes for each interview; these were subsequently refined in a longitudinal and transverse cyclic analytical process, moving backward and forward between the interviews. To improve the credibility and transferability of the analyzed data, we performed investigators' triangulation by having a co-author code six interviews independently (two from each group). Similarities and differences in the interpretation of the data were debated until agreement
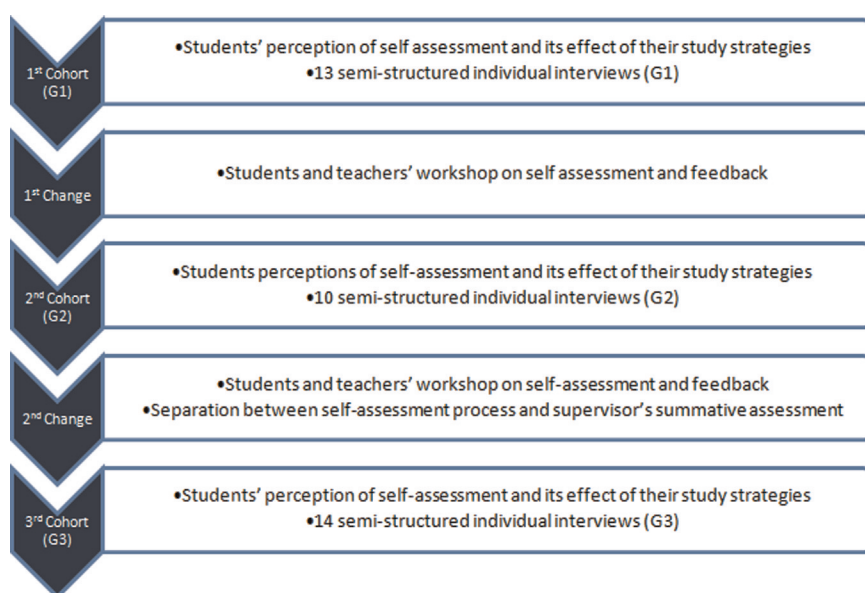

Fig. 1. Two implemented changes on the three different cohorts of students.

was reached. We performed member checking to achieve further improvement in the credibility and transferability of the data. The results were presented to a group of students who were asked to provide feedback. The approval and financial support of the King Abdullah International Medical Research Centre were obtained prior to conducting the research.

Results

We noticed significant similarities in the themes abstracted from the interviews with the three groups, thus they were analyzed together. Analysis of the data for the three cohorts generated three main themes (Table 2). To illustrate how our concept of the effect of self-assessment on student study strategies is grounded in the data, we present quotes from the transcripts. Quotes by different cohorts of students are marked G1, G2 or G3.

Strategic practice of self-assessment

Students admitted overestimating their self-assessment in an attempt to impress their supervisors and manipulate their decisions to gain higher marks. Even those students who had assessed their own performances correctly or underestimated their self-assessment were looking for better marks. However, the strategic use of the self-assessment was inconsistent, ranging from overestimation to underestimation of performance. This practice persisted for those who received orientation on how to perform self-assessment, even after eliminating the summative effect of the clinical supervisors' evaluation.

Table 2. Various themes and codes that were obtained through data analysis

Theme	Code
Feedback and study strategy	
	Feedback and faculty enhancement
	Feedback and students' orientation
	Feedback as a drive to learn
Self-assessment and study strategy	
	Self-assessment as a drive to learn
	Self-assessment and faculty enhancement
	Self-assessment and students' orientation
Strategic practice of self-assessment	
	Overestimation of self-assessment
	Underestimation of self-assessment
	Accurate estimation of self-assessment
	Self-assessment and summative effect
	Self-assessment and students' self satisfaction

We are human beings; we are likely to give ourselves better evaluations than what we deserve. (G3)
I have a self-assessment form already completed in my USB. I rated myself 3 [full mark]. Whenever an evaluation form is needed, I print the ready form and only change the date and the supervisor name. (G2)

The students believed in the accuracy of supervisors' assessment compared with their own. However, students continued to focus on their marks when they self-assess; they rarely focused on improving their ability to maintain patients' safety, better clinical performance or practice enhancement. The dominant summative mode enhanced students' strategic or achievement-motivating study strategies. Even the third cohort, whose self-assessment was independent of their summative marks for the clinical attachment, thought their overestimated self-assessment led to higher self-satisfaction and more confidence in patient care, representing another aspect of an achievement-motivating strategy. The students isolated their self-assessment practice from the other major component of self-assessment process, namely the supervisors' formative feedback. Students' direct interactions with their patients, each other and their clinical supervisors did not change their perceptions of their self-assessment.

I don't have a fixed strategy for marking myself. Sometimes I give myself outstanding marks; sometimes I put an average mark. It depends who my supervisor is. (G2)
I think the supervisors' assessment is more accurate. People around you can judge your performance more accurately ... Nobody underestimates himself, except a few ... I usually overestimate myself because of the marks and GPA ... (G1)

Self-assessment and study strategies

The majority of students did not perceive their self-assessment as a drive to learn; only a minority saw self-assessment as playing a positive role in their learning. It initially appeared that the summative effect of the implemented self-assessment limited the positive impact on student learning. However, students persisted in using the same study strategy after eliminating the summative effect of their supervisors' evaluation. Self-assessment, when isolated from supervisor feedback, did not show a positive influence on the practiced study strategies; either it had no effect on students' learning, or it stimulated an achievement-motivating study strategy in which students put all their efforts into obtaining higher marks.

It looks like a good idea, but actually, in real life, it is just a matter of formality ... I don't give it importance. It doesn't change the way I study or approach my patients. (G2)

I don't think that it is going to make a big difference … I will become a doctor, and I have to be a very good doctor. So I will work hard whether I self-assess or not. (G3)

When I self-assess, this is a trigger for me to learn … It helps me to know where my defects are so I can try to correct them. (G1)

Feedback and study strategies

Students' perceptions of the effect of feedback on their studying and study strategies were also inconsistent. However, the majority of the interviewed students affirmed the positive effects on their studying. Some disagreed with the existence of a positive effect, while a minority adopted the extreme view that feedback is occasionally deceiving.

I follow my supervisors' feedback … but … when it comes to the exams, I sometimes find myself off the right track … It is sometimes deceiving. (G1)

The majority of students, however, believed that formative feedback from supervisors guided them in identifying the necessary knowledge and skills for good patient care; it also identified their knowledge and skills gaps and provided ways in which these gaps could be overcome. Formative feedback had a positive effect on students' performance. It helped them to approach their patients' problems systematically, search for evidence and construct suitable management plans. Thus formative feedback stimulated a deeper approach to learning.

Feedback will help me to identify whether I am on the right track or not, whether I need to improve on some points or just carry on with what I'm doing. For example, if I am managing a patient and I don't know how to approach the case, I waste my time reading irrelevant information. Later, through feedback, I find that I shouldn't have done so. (G1)

Occasionally, negative feedback resulted in student frustration, affront and loss of confidence in directly encountering patients, and stimulated a superficial approach to learning.

Students commented on the quality of the feedback provided, and stressed the need to improve the practice through supervisor training. Moreover, despite students' appreciation of the importance and benefit of the orientation and training they received on self-assessment and the utilization of formative feedback, they continued to observe inconsistencies in their supervisors' feedback, even after the supervisor workshop on providing effective feedback. Because of these inconsistencies in the quality of feedback provided, students' practice of study strategies varied between deep and superficial.

I thought it was going to be a formal, boring meeting, but it was nice. I got a lot from that meeting, and I changed a lot based on it. I realized we were missing the meaning of feedback and the

effective communication between the students and their seniors. (G2)

Some of the supervisors are very excellent, but they are few. The majority are not good at giving feedback … usually they try to give you a general opinion. (G2)

Discussion

In the community of clinical practice, several factors were found to contribute to students' perceptions of self-assessment and their practice of study strategies. Students favored training on how to practice self-assessment and the benefits of feedback. However, this training did not change students' strategic practice of self-assessment or their tendency to overestimate themselves, nor did it contribute to students' perceptions of patient care or their ability to encounter patients. Regardless of the strategy used for self-assessment (overestimation or underestimation of self-performance), the practice was influenced by students' attempts to manipulate their supervisors' summative assessments and receive higher marks or simply make a good impression. This resulted in an achievement-motivated study strategy and turned the students into grade-seekers. Students valued formative feedback and agreed that it contributed to a deep approach to learning. However, negative feedback was found to result in negative feelings, patchy reading and a superficial approach to learning.

We evaluated the implemented self-assessment program in the community of clinical practice and the resulting student study strategies in relation to Kirkpatrick's four-level evaluation model. We assessed the degree to which the students reacted favorably to the self-assessment orientation and implementation, and the degree to which they have acquired the intended knowledge, skills and attitudes to allow them to practice better study strategy based on their participation in the learning event (24). Our analysis thus reached the second level of Kirkpatrick's four-level model (Fig. 2). In general, students reacted favorably to the education workshops on practicing self-assessment and feedback. This finding was not surprising, as McDonald and Boud obtained similar results by addressing the effect of self-assessment training on the performance of secondary school students in external examinations (25). They concluded that the pupils received the training positively and accepted it as beneficial rather than as an additional burden in their examination year. However, while McDonald and Boud studied students' academic improvement after they had experienced self-assessment, we explored the study strategies practiced by students because of self-assessment implementation. Similar to McDonald and Boud's pupils, our students acquired the intended knowledge and skills needed to practice self-assessment and utilize feedback. However, unlike McDonald and Boud's students, our cohorts did not change their attitudes toward studying
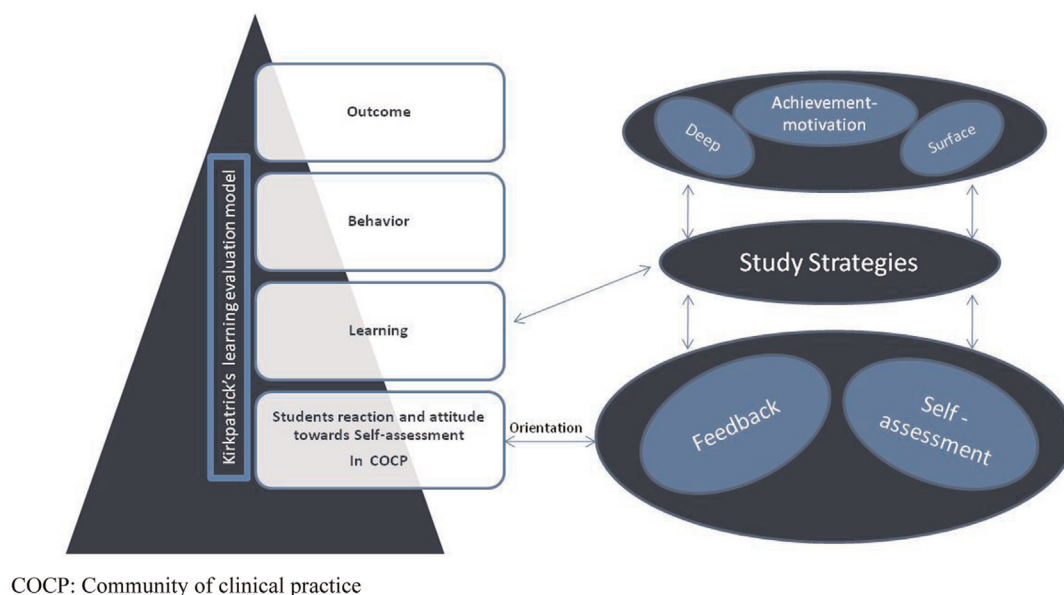
COCP: Community of clinical practice

Fig. 2. Evaluation of self-assessment related factors contributing to students' study strategies in the 'community of clinical practice'.

and continued to practice pre-planned strategies in response to their participation in the learning events within the community of clinical practice.

It appears that education workshops such as those implemented in our study are insufficient to change students' self-assessment practices and their strategic uses of this type of assessment (26). We should note that the summative characteristic of our assessment and our graduate cohort of students, who were more mature than McDonald and Boud's pupils, could have contributed to our students' behavior and their tendency to become grade-seekers (17). Interestingly, McDonald and Boud were unsure of the generalizability of their results, and discussed factors that may have contributed to the positive impact of the implemented self-assessment for their students. In their view, students' high potential for adopting self-assessment practices was influenced by the researchers, who were seen as representatives of the examination committee, thus the studied group was more motivated than the comparison group.

Implementing self-assessment-related feedback in the community of clinical practice depends on supervisors' roles in student learning. To implement this component appropriately, the supervisor's role should extend beyond attending a carefully designed orientation program and excellent training. The supervisor should motivate and lead the knowledge and skills acquired through learning into behavior or, more precisely, assist in changing culture. Supervisors should play a major role in guiding students toward the appropriate practice of self-assessment and using supervisor feedback. Their role includes deliberate and consistent knowledge and skills reinforcement (27,

28), consistent work to change the culture and expression of a high level of accountability through effective coaching of teaching sessions (21, 28, 29). The degree to which this reinforcement and coaching occurs may contribute to students' performance improvement, change the culture and obtain positive outcomes of self-assessment (27, 30).

In our case, the effort in implementing an education/orientation workshop alone was not sufficient to change students' attitudes. We assume that our students' inappropriate experience of self-assessment was not related to failure in establishing a suitable educational workshop; rather, it is related to failure in changing culture. We cannot neglect the possible contributing factors to our students' attitudes to self-assessment: cultural background, previous education, personal beliefs and preferences and the accompanied summative assessment may affect their perceptions of self-assessment, its practice and the resulting study strategies (30). In-depth exploration of the effect of these factors on students' self-assessment practice is a place for future research.

The most important questions we would like to answer is the following: which of the two components of the self-assessment process has the largest effect on students' study strategies – the self-assessment practice or the provided feedback? Examining our results, we found that despite students' positive perceptions of self-assessment, this was not successful in changing their study strategies or strategic approaches to learning; students had a major tendency toward overestimation of their performance. However, appropriately provided feedback was associated with problem identification, correction and therefore a better approach to learning. It thus appears likely that

the theoretical advantages linked to the self-assessment process are a result of its feedback component rather than the practice of self-assessment isolated from feedback (8).

One limitation of this study is that the study population is male. We are not aware of research comparing males with females concerning the study strategies resulting from self-assessment practice. Another limitation is the lack of evidence on specific cultural values that may have contributed to the results. Finally, the variability of supervisors' experiences in the self-assessment process and feedback might have affected our results.

Conclusion

In the community of clinical practice, it appears that of the two major components of the self-assessment process (self-assessment and feedback), feedback is the most effective in enhancing students' study strategies, leading them toward a deep approach to learning. The feedback component appears to be highly responsible for the documented positive effects of the process. The practice of self-assessment on its own does not seem to be of significant value in enhancing students' learning quality, particularly when applied within a summative context. Further research that examines the effects of cultural, contextual and personal values on the practice of self-assessment and feedback is needed.

Competing interests

The authors declare that they have no competing interests.

Acknowledgments

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Appendix 1. Open-ended questions used during the interviews

1. What is your opinion of the value of self-assessment? Why?
2. What is your opinion of the value of feedback? Why?
3. What is your opinion of the value of orientation on self-assessment? Why?
4. How did you benefit from the orientation workshop you have attended? Why?
5. What are the learning opportunities/benefits obtained from practicing self-assessment? Why?
6. What are the personal uncertainties that can be sorted out by practicing self-assessment? Why?
7. What do you think of having self-assessment implemented as a major assessment tool? Why?
8. On what principle/strategy you are marking (self-assessing) yourself? Why?
9. Why do you think some are overestimating/underestimating themselves?
10. On what principle do you think your supervisor marks you? Why?
11. How do you think you can improve on your self-assessment? Why?
12. How do you think you can benefit from your self-assessment? Why?
13. What about self-assessment as a factor contributing to future safe practice? Why?